

U.S. Application Serial No: 10/085,469
Filed on February 28, 2002
Response dated September 8, 2006
In Response to Final Office Action dated March 10, 2006

REMARKS

Claims 1-8, 30, 36-40 are in this application.

Independent claims 1, 30, 36, 37, and 38 were amended by adding the further limitation.

Claims 1-8, 30, 36-40 are pending in this application.

Claims 1-8, 30 and 36-40 have been rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Murakami et al. (U.S. Patent No. 6,865,068), herein after Murakami et al.

Applicants direct the Examiner to the Declaration under 37 C.F.R. 1.132 dated December 8, 2005 to address the Murakami et al. reference.

A brief review of the Declaration is provided.

Table 1 relates to Pore Volume Distributions (cm^3/g) for representative Activated Carbons that are described in the above identified U.S. Patent Application Serial No. 10/085,469.

These representative Activated Carbons were prepared by heat treating activated carbon by the method of the present invention to enhance adsorption of taste and odor compounds and total organic carbons.

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The volume distribution measurements in the present experiments are based on argon adsorption method. This method offers data on the micropores and mesopores, but it inherently cannot provide information on the macropores.

In order to characterize the macropores, the Applicants have conducted mercury porosimetry analyses on several of these activated carbon samples that have been kept in the laboratory.

Macropores, according to IUPAC definition, include all pores up to the size of spaces between one grain and another. Thus, the Applicants have identified macropores to include those with diameters from 200 Å to 20,000 Å.

The lower limit for macropores recited in claim 1 of Murakami et al. is 200 Å.

The Mercury Porosimetry analyses indicated that the pressure of 0.725 MPa corresponded to pore diameters of 20,000 Å, while the 29.4 MPa pressure corresponded to pore diameters of 500 Å.

Duplicates were conducted for several samples, and duplicates were on average within 15% of one another.

The argon adsorption data, which are included in the present Application, was used here to depict pores in the < 500 Å and in the 200 to 500 Å diameter range.

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The mercury porosimetry results, coupled with the argon adsorption results from the present Application are as shown in Table 1.

Table 1:
Pore Volume Distributions (cm³/g) for Representative Activated Carbons that were included in the present Application

Activated Carbon	Argon Adsorption Pore Volume <500 A diameter	Argon Adsorption Pore Volume, 200-500 A diameter	Mercury Porosimetry Pore Volume 500 to 20,000 A diameter	Total Pore Volume <20,000A diameter	Pore Volume 200 to 20,000 A diameter	%volume of macropores having diameters exceeding 200 A
CH ₄ /H ₂ O (1000)-1	0.71	0.04	0.29	1.00	0.33	33
H ₂ O (1000)	0.67	0.09	0.35	1.02	0.44	43
Pilot A	0.61	0.11	0.39	1.00	0.50	50
Pilot B	0.64	0.11	0.40	1.04	0.51	49
Pilot C	0.94	0.22	0.44	1.38	0.66	48
Commercial Lignite A	0.46	0.08	0.33	0.79	0.41	52

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As concluded by co-inventor Dr. Fred S. Cannon in the above Declaration under 37 C.F.R. 1.132 dated December 8, 2005, and as it can be clearly seen from Table 1 above that, for the Activated carbons of the present invention, the % volume of macropores having diameters exceeding 200 A ranged from 33 to 50 %.

In claim 1, Murakami et al. discloses a carbonaceous material, which is defined as follows:

“1. A carbonaceous material which has a total pore volume of from 0.5 to 1.5 cm³/g per unit mass, a volume of micropores having diameters of from 10 to 20 A of from 10 to 45 % based on the total pore volume, a volume of mesopores having diameters of from 20 to 200 A of from 35 to 65 % based on the total pore volume, a volume of macropores having diameters exceeding 200 A of not more than 15 % based on the total pore volume, and a specific surface area of from 1,000 to 2,500 m²/g.”

Applicants have amended independent claims 1, 30, 36, 37 and 38 by adding the further limitation that:

“the percent volume of macropores having diameters exceeding 200 Angstroms range from about 33 % to about 50 %.”

The above-defined property is inherent to the activated carbon materials according to the present invention as clearly shown by the Declaration dated December 8, 2005. Thus, Applicants have stated explicitly what is an inherent property of the

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instantly claimed carbon materials, namely that "the percent volume of macropores having diameters exceeding 200 Angstroms range from about 33 % to about 50 %."

In contrast to Murakami et al., the instantly claimed carbonaceous material as defined in claim 1, as amended, reads as follows:

"1. An activated carbon comprising:
a pore volume per gram of said activated carbon more than about 0.32 mL in the pore width range between about 4 to 63 angstroms; and
a pore volume per gram of said activated carbon more than about 0.21 mL in the pore width range between about 63 to 500 angstroms; provided that the pore volume per gram of said activated carbon in the pore width range of about 20 to 63 angstroms is at least about 25% of the total pore volume per gram of said activated carbon in said pore width range of 4 to 63 angstroms, as measured per the Argon Adsorption Density Functional Theory protocol and provided that said activated carbon exhibits a pH equal to or greater than 9.9, when immersed as a slurry in nitrogen-purged deionized distilled water, while the slurry contains about 10% by weight of activated carbon, as measured per the Slurry pH protocol;
wherein the percent volume of macropores having diameters exceeding 200 Angstroms range from about 33 % to about 50 %."

This range of 33 to 50 % is considerably higher than the **15% maximum** required by Murakami et al.

Accordingly, the activated carbons described in the present application are entirely different than those described by Murakami et al.

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Therefore, the rejection of claims 1-8, 30 and 36-40 under 35 U.S.C. §102(b) as being anticipated by Murakami et al. should be withdrawn and claims 1-8, 30 and 36-40 should be allowed.

Further, the activated carbons described in the present application are neither taught nor suggested by Murakami et al. There is no teaching or suggestion in Murakami et al. that the % volume of macropores in the activated carbons having diameters exceeding 200 A should be in the range from 33 to 50 %.

In fact, Murakami et al. teaches away from the instantly claimed carbons by requiring that the carbons described by Murakami et al. have:

“a volume of macropores having diameters exceeding 200 A of not more than 15 % based on the total pore volume,” (see, for example, claim 1 of Murakami et al.).

Therefore, the rejection of claims 1-8, 30 and 36-40 under 35 U.S.C. §103(a) as being obvious over Murakami et al. should be withdrawn and claims 1-8, 30 and 36-40 should be allowed.

A request for a three-month extension of time is made to extend the date for Response to September 10, 2006.

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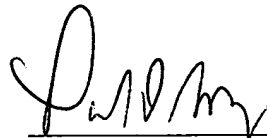
Applicants respectfully request that the Examiner contact the undersigned should there be any issues that could be resolved to move the prosecution forward and place this application in condition for allowance.

In view of the above amendments and remarks Applicants respectfully request reconsideration of this application and allowance of all pending claims.

Respectfully submitted,

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By:



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